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Psychometric Evaluation of the Thai Male Depression Risk Scale (MDRS-TH)

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Abstract

Previous studies have reported that males frequently suffer from major depression. However, due to the norms of masculine roles, in which emphasis is placed in displaying strength, invulnerability, and control, the ways that some men exhibit depression may differ from traditional diagnostic symptoms of major depressive disorder. To this end, the Male Depression Risk Scale (MDRS) has been developed in order to better identify those men, who experience low moods and are at risk for suicide. This study evaluated the psychometric properties of the Thai version of the MDRS (MDRS-TH). A cross-sectional study was conducted with 600 participants, who were recruited through social media (male N=300). The average age was 38.74 years. About half of the participants were married (51.5%). The majority identified themselves as Buddhist (94.66%) and had completed postgraduate education (31.16%). The samples had a variety of occupations, including farmer, employee, student, retired, own business, etc. The data were analyzed using confirmatory factor analysis, Cronbach's alpha coefficient, and criterion-related validity using Pearson's correlation. The overall analysis (N=600) found that the MDRS-TH was consistent with the empirical data (CFI=0.918, TLI=0.905, SRMR=0.05, and RMSEA=0.05). The final model consisted of 5 components: 1) emotional suppression, 2) alcohol use, 3) anger & aggression, 4) somatic symptoms, and 5) risk-taking behaviors. The internal consistency of the MDRS-TH total score was 0.89, and the correlation criterion-related validity with the PHQ-9 was r=0.77. The results supported the fact that the MDRS-TH is a useful screening tool. Utilizing the MDRS-TH in primary care settings may assist to identify those men who are at risk for male-specific symptoms of depression so that early identification and intervention can be facilitated. In future studies, the generalizability of the scale would be strengthened if efforts to improve cross-cultural validation involving different cultural groups in Thailand were prioritized.

Keywords**:** *masculinity; psychometric evaluation; MDRS-TH; depression Risk; nursing; psychometrics*

1. Introduction

Depression is a common mental disorder. Globally, it is estimated that more than 322 million people suffer from major depression (World Health Organization (WHO), 2021). The World Health Organization has suggested that by 2030, depression will be the single biggest cause of ill health (WHO, 2008). Moreover, depression can lead to suicide, and it is reported that more than 700,000 people a year die from suicide, with suicide rates among males being twice as high as females (WHO, 2021). In contrast, epidemiological evidence in many countries around the world shows that the proportion of depression is two-thirds higher in women than in men (WHO, 2017; WHO, 2021). Over the past 10 years, a group of researchers from Western schools have been studying depression and asking the question: "Why is there a lower prevalence of depression in men than in women?" An important concept that has

been described for this study is the concept of gender socialization in the dimension of male gender norms (Flaskerud, 2014; Addis, & Mahalik, 2003; Addis, 2008).

The first issue concerns gender bias and the criteria used to diagnose depression according to the Diagnostic and Statistical Manual of Mental Disorders (DSM IV) that identified criteria as symptom consistent with gender roles in women focusing on the expression of emotion and feeling ("act in") such as feelings depressed, exhausted, declined in happiness (Kilmartin, 2005). The second issue is seeking help behaviors among gender. The concept of masculinity is a major barrier for men to seek help when they suffer from depression, because men view depression as weakness (Spillman, 2006; Brown et al., 2012; Hudson et al., 2018). The feelings of powerlessness, hopelessness, inability to control oneself are opposite to what society has expected of masculinity; and men could feel stigmatized by telling others people about his depressive conditions (Johnson et al., 2012; Chuick et al., 2009; Hudson et al., 2018). For this reason, many men experience depression without seeking help or receiving treatment. And the third issue is the differences in how men and women express depression. Women are more likely to be diagnosed with depression compared to men; and men tend to hide their depressive mood and symptoms; in which scholars called this action as masked depression (Brownhill et al., 2005; Bryant, 2008; Brown et al., 2012; Magovcevic, & Addis, 2008). This is because men see depression as a weakness and an inability to control their own emotions, thoughts and feelings (Rungreankulkij et al., 2019; Spillman, 2006). These depressive feelings are at odds with the masculine identity expected by society. Therefore, some men reject the feeling of sadness and hide it. In addition, men are unaware of their emotions and feelings, often failing to report the actual symptoms or exhibit signs of depression (Addis, 2008; Brownhill et al., 2005; Bryant, 2008; Moller–Leimkuhler, 2010; Rochlen et. al., 2010). Therefore, it is difficult to recognize and diagnose depression in men.

The results of the Thai research studies are consistent with those of many overseas studies: Men and women exhibit different symptoms of depression. It was found that the majority of men do not express their feelings of sadness or tell other people about their emotions. However, their symptoms are manifested by physical reactions such as insomnia, fatigue, headaches, lack of concentration, inefficient and unproductive work, boredom, irritability and easily becoming angry (Kaewjanta, & Rungreangkulkij, 2022; Arunpongpaisal, & Rungreangkulkij, 2010). Unlike women with depression, they clearly show their feelings and emotions through their facial expressions when they are sad and worried about their negative self-perception (Kaewjanta et al., 2016). Because of these differences between the sexes, it is difficult to diagnose depression in Thai men.

According to the literature review, a group of scholars from the Western schools have recognized the importance of noting the differences in depressive symptoms between women and men. Therefore, assessment tools for screening depression in men with sensitivity and specificity have been developed, which are called the Gotland Male Depression Scale (GMDS) (Zierau et al., 2002) and the Masculine Depression Scale: MDS (Magovcevic, & Addis, 2008). Both of them were developed for Western men within the context of their cultures and societies. However, both of the assessment instruments failed to examine structural validity and lacked reliability in both exploratory factor analysis and confirmatory factor analysis (Möller-Leimkühler, & Yücel, 2010; Innamorati et al., 2011; Rice et al., 2013; Rice et al., 2017).

The Male Depression Risk Scale (MDRS) was developed in 2012 and is now widely used in assessing male depression (Rice et al., 2017; Rice et al., 2019; Walther et al., 2021; Herreen et al., 2022; Rice, 2012). The validity and reliability of the MDRS were initially developed with Australian males, and have been re-validated with Canadian, German and elderly men (Rice et al., 2019; Walther et al., 2021; Herreen et al., 2022). According to exploratory factor analysis and confirmatory factor analysis, the MDRS consisted of the 6 following components: 1) emotional suppression, 2) drug use, 3) alcohol use, 4) anger & aggression, 5) somatic symptoms, and 6) risk-taking behaviors. The Cronbach's alpha coefficients for each of the sub-components were 0.79, 0.58, 0.66, 0.79, 0.70, and 0.78, respectively (Rice, 2012). Later, the MDRS assessment model was widely used in research studies. A study found that this assessment tool was sensitive in assessing the risk of depression in males across various racial groups, such as Germans, Australians, and Canadians, and has been used in

primary care for screening depression (Rice et al., 2017; Walther et al., 2021; Herreen et al., 2022; Rice, 2012). Moreover, the MDRS can be used to assess the risk for suicide among males, which is an important indicator to predict distress (Rice et al., 2015).

Depression is considered a cultural illness, which addresses the fact that the experiences, meanings, and symptoms of depression can vary across social and cultural contexts (Kalibatseva, & Leong, 2018). The use of cross-cultural instruments is important when comparing the variables of interest during cross- cultural or international studies because it helps to answer the question of whether the results of research conducted among members of one culture can be applied to another culture. Moreover, it improves the process of understanding the phenomena of health and morbidity in populations from different cultures and ethnicities (Waltz et al., 2018). At the same time, the instruments must be consistent with the context of the cultures, societies, and ethnicities that are being studied. Depression screening tools widely used in Thailand (i.e., the Patient Health Questionnaire (PHQ-9), Nine questions (9Q)) lack a gender- specific lens. As a result, men with depression may not be aware of the presence of male-specific depression symptoms, and this factor can delay the treatment process. Consequently, a standardized male- specific assessment tool in Thai language that can be used for the study of depression in Thai men is essential.

2. Objectives

1) To examine the psychometric properties of the Thai version of the MDRS (MDRS-TH).

2) To evaluate of the criterion- related validity determined by comparing the MDRS- TH with the PHQ-9, including sex-based comparisons.

3. Materials and methods

3.1 Study Design

This study was a cross- sectional analytic study. Due to the COVID- 19 pandemic, the sampling approach employed in this study utilized online (Facebook and Line applications) surveys because they could be quickly implemented at a generally very low cost (Schneider, & Harknett, 2022). The data were obtained through social networking sites between November 2022 to January 2023. Data collection process is as follows.

1) Online questionnaires were developed through Google forms with restricted access to data.

2) The researcher disseminated information about the research project through advertisements in which the participation criteria were described in detail. The link to the questionnaire or QR code was disseminated through social media platforms, such as Facebook, Line, personal profiles and public groups.

3) People who were interested in participating in the research project accessed the online questionnaire via a web browser on their smartphones, tablets or computers connected to the internet. Before beginning the survey, participants were presented with a document explaining the research objectives and the benefits of participation. Consent was obtained electronically before they provided their information.

4) The questionnaires contained 40 questions, which took participants approximately 30 minutes to complete. Once completed, the questionnaires were submitted anonymously through the system so that the researcher could not identify individual respondents.

The problems arising from the use of Internet-based survey methods to derive mental health scores may have been underestimated. Consequently, the research team was aware of this limitation. In the information given to potential participants, we placed emphasis on the benefits of answering truthfully by stating that the findings from the research would contribute to increasing accessibility to depression screening and would also help to develop specific interventions for men with depression. In addition, we also informed potential participants that they could calculate their own depression scores. Information about self-care was also provided, as well as access to professional help if they wished.

3.2 Measurement

General characteristics: General information about the characteristics of the sample was collected consisting of age, sex, marital status, religion, educational levels, occupations, household incomes, and health problems.

MDRS Thai Version (MDRS- TH): The Thai version of the Male Depression Risk Scale (MDRS- TH) was translated using Brislin's translation model for cross- cultural research (Brislin, 1970), which consisted of the 5 following steps:

Step 1 – The forward-translation: Using a symmetrical translation approach, three language experts translated the tool from English into Thai to reduce bias. Then the forward translators evaluated each other's versions. Any differences were discussed at the language experts committee meeting until all the forward translators had agreed on the final forward translation version.

Step 2 – The back-translation: Two reviewers re-checked the content equivalence and semantic equivalence of the Thai assessment tool with the original one. The experts commented that the content in the Thai version was good. However, some suggestions were made with regard to revising some words in order to facilitate better comprehension.

Step 3 – The Backward translation: The language experts from the Language Institute completed a backward translation of the MDRS that had been obtained from the step 2.

Step 4 – Comparing the original version and the back-translated version: The backward translation version was checked by the developer of the MDRS (Simon Rice). The items in the Thai translated version were determined to be equivalent to the original version.

Step 5 – The Pilot study: After receiving the MDRS Thai translated version, the assessment tool was pilot tested with 60 Thai men 18 years of age and over. The data, which was obtained through two online social networks applications (Line and Facebook), were analyzed for internal consistency reliability using Cronbach's alpha coefficient (α=0.72).

Patient Health Questionnaire-9 (PHQ-9): The PHQ-9 is a self-assessment questionnaire for depression with nine key symptoms listed in the DSM-5 (American Psychiatric Association, 2013; Sun et al., 2020). The study found that the PHQ-9 assessment showed an internal reliability of 0.79. The PHQ-9 has been used as a comparison tool to verify the correlation criterion-related validity. Furthermore, it has been widely employed to compare newly developed assessment tools that are being applied in order to assess depression in both research studies and clinical trials (Rice et al., 2017; Walther et al., 2021; Herreen et al., 2022; Rice, 2012).

3.3 Participants and Data Collection

With regard to participating in the project, the participants received information that had been publicized on social media via Facebook and Line applications. This recruitment method, which utilized social media, aimed at obtaining a variety of characteristics from the samples, including age, educational level, occupation, and income. The inclusion criteria were as follows: 1) being female or male, 2) being 18 years of age and older, 3) being a native ethnic Thai national, and 4) being capable of reading Thai fluently. Prior to participating in the study, participants received detailed information regarding the study; after which they were asked to provide signed consent. To ensure adequate scale development, a commonly accepted guideline suggests that when seeking to construct a unidimensional scale from a pool of 20 items, a sample size of N = 300 may be considered as sufficient (Kyriazos, 2018). Six hundred participants completed questionnaires, including 300 men (50%) and 300 women (50%), whose average age was 38.74 years. About half were married (51.5%), the other half were single (42.67%). Most of them were Buddhist (94.66%) and had a postgraduate degree (31.16%). The samples had a variety of occupations including farmer (23.00%), employee (20%), student (18.83%), retired (10.83%), own business (10.5%), etc. Most of them had insufficient income (52%) and no health problems (89.17%) (Table 1).

3.4 Data Analysis

The data were analyzed using IBM SPSS AMOS v.28. The evaluation of MDRS construct validity was undertaken using confirmatory factor analysis (CFA). Confirmatory factor analysis (CFA) was chosen as the primary data analysis method because the Male Depression Risk Scale (MDRS), developed in 2012, is widely used to assess depression in men. The initial validity and reliability of the MDRS was developed in Australian men and revalidated in Canadian, German and older men (Rice et al., 2019; Walther et al., 2021; Herreen et al., 2022). The results of the exploratory and confirmatory factor analysis showed that six components, including 1) Emotional Suppression, 2) Drug Use, 3) Alcohol Use, 4) Anger and Aggression, 5) Somatic Symptoms, and 6) Risk Behavior, were significant components of the MDRS. The coefficients for each of these subcomponents were 0.79, 0.58, 0.66, 0.79, 0.70, and 0.78, respectively (Rice, 2012).

Table 1 General characteristics of samples (N=600)

The Characteristics of the Sample	Total (n=600)		Males (n=300)		Females (n=300)	
	n	(%)	n	(%)	n	(%)
Ages	Mean 38.74 (sd=14.14)		Mean 37.96 (sd=15.99)		Mean 39.51 (sd=11.98)	
Marital Statuses						
Single	256	42.67	122	40.67	134	44.67
Married	309	51.5	155	51.67	154	51.33
Divorced/Widowed	35	5.83	23	7.67	12	4
Religions						
Buddhist	568	94.66	277	92.33	291	97
Christian	19	3.17	17	5.67	2	0.67
Islamic	13	2.17	6	2	7	2.33
Educational levels						
Elementary school	118	19.67	37	12.33	81	27
Secondary school	67	11.17	23	7.67	44	14.67
Diploma/Certificate	64	10.67	35	11.67	29	9.67
Bachelor's degree	103	17.17	30	10	73	24.33
Post-graduate	187	31.16	132	44	55	18.33
Not specified	61	10.16	43	14.33	18	6.00
Occupations						
Unemployed	28	4.67	17	5.67	11	3.67
Studying	113	18.83	30	10	83	27.67
Farmer/farming/farming	138	23	36	12	102	34
Own business/trade	63	10.5	29	9.67	34	11.33
Civil servant/Pensioner	65	10.83	55	18.33	10	3.33
Staff member/employee	120	20	82	27.33	38	12.67
State enterprise	42	7	28	9.33	14	4.67
Not specified	31	5.17	23	7.67	8	2.66
Incomes						
Not sufficient	312	52	154	51.33	158	52.67
Sufficient	288	48	146	48.67	142	47.33
Health problems						
No	535	89.17	262	87.33	273	91
Yes	65	10.83	38	12.67	27	9

The assumptions of the CFA consisted of the following: 1) multivariate normality; 2) a sufficient sample size N > 200 that could offer adequate statistical power for data analysis (Kyriazos, 2018), based on the Bartlett's test of sphericity (8193.74, $p < .001$); and 3) a Kaiser-Meyer-Olkin measure of sampling adequacy that was equal to 0.91, indicating the suitability for CFA. The second order CFA was performed to verify the structural validity of the MDRS. Accordingly, confirmatory factor analysis was undertaken using maximum likelihood estimation. The following fit indices were evaluated: 1) the goodness of fit index (GFI), 2) the Tucker-Lewis Index (TLI), 3) the adjusted goodness of fit index (AGFI), 4) the root of the mean, 5) the root of the mean square remainder in standard score form (standardized root mean square residual: SRMR), and 6) the root mean square error of approximation (RMSEA) by considering CFI, TLI and AGFI values to be greater than 0.90-0.95, and the SRMR and RMSEA values to be less than 0.05, which indicated that the model was in good agreement with the empirical data (Brown, 2015; Schweizer, 2010). Standardized loading of the components with the empirical data was carried out in order to find the weights of 6 components in the MDRS-TH assessment by separately analyzing both sexes and then making comparisons between the male group and the female group.

The analysis of reliability for MDRS-TH was performed with Cronbach's alpha and the Omega coefficient. To assess the criterion-related validity, the MDRS-TH was compared to the PHQ-9 by employing Pearson's correlation coefficient. This analysis encompassed both sexes, with further examination of the male and female groups being conducted separately.

Ethical consideration

This research project was reviewed and approved by the Human Research Ethics Committee of Khon Kaen University (HE652016).

4. Results

4.1 The construct validity of the MDRS Thai version (MDRS-TH)

An analysis of variance using the Chi-square statistic revealed significant differences between the female and male groups ($X2 = 67.67$, $p < 0.01$). Consequently, this study comprised both combined and separate analyses for males and females in order to assess the model's consistency with the empirical data. The overall analysis (N=600) showed that the model was found to be inconsistent with the empirical data ($\chi2 = 1102.58$, $df = 203$, $p < 0.001$, CFI = 0.887, TLI = 0.87, SRMR = 0.062, and RMSEA = 0.086). After the analyses was conducted separately among the males (n=300) and females (n=300), the model was also found to be inconsistent with the empirical data when considering the statistics used to check the validity of the model: ($\chi2$ =992.72, df=203, $p < 0.001$, CFI =0.842, TLI =0.821, SRMR =0.069, and RMSEA =0.114) and ($\chi2 = 895.65$, df=203, $p < 0.001$, CFI = 0.816, TLI = 0.791, SRMR = 0.078, and RMSEA = 0.107), respectively.

When considering the factor loadings, the sub-component of 'Drug Use' had exhibited a particularly low factor loading (0.23). This was lower than the quality criteria of the standard assessment tool, which should exceed 0.50 (Brown, 2015). The endorsement of the three 'Drug Use' items had occurred very infrequently (i.e., Item 13=3.5%, Item 18=2.1%, and Item 22=2.4%). Accordingly, the sub-component of 'Drug Use' was excluded from the model, and the data were analyzed once again.

After omitting the results of the domain of 'Drug Use,' the CFA results for the whole sample (N=600) were consistent with the empirical data ($\chi2 = 719.55$, $df = 147$, $p < 0.001$, CFI = 0.918, TLI = 0.905, SRMR = 0.05, RMSEA = 0.05). All components were shown to have positive loadings, with component weights that ranged from 0.46–0.83 (p's<.001). The results showed that the components with the highest weights had been 'Anger & Aggression' (0.83), 'Alcohol Use' (0.60), and 'Risk-taking' (0.58). Moreover, each sub-component explained a variance in the MDRS-TH scores ranging from 33% to 99% (as shown in Table 2 and Figure 1).

The sex-specific results of the CFA analysis showed that after the 'Drug Use' sub-component had been omitted, the 5-factor model was determined to be inconsistent with the empirical data with regard to the statistical values. The results of the CFA analysis separated the genders with males (n=300) ($\chi2 = 700.555$, $df = 147$, $p < 0.001$, CFI = 0.854, TLI = 0.831, SRMR = 0.079, and RMSEA = 0.112) and with females (n=300) ($\chi2 = 581.529$, $df = 147$, $p < 0.001$, CFI = 0.871, TLI. = 0.850, SRMR = 0.074, and RMSEA = 0.099), respectively (as shown in Figure 1 and Table 2).

4.2 The Internal consistency of the MDRS-TH

After the Cronbach's Alpha coefficient of the MDRS-TH had been calculated, the following internal consistency values were found: 0.92 (total sample), 0.91 (males), and 0.91 (females). Moreover, after the Omega coefficient of the MDRS-TH had been determined, the following values were found: 0.89 (total sample), 0.86 (males), and 0.87 (females) which details are shown in Table 3.

4.3 The criterion-related validity of MDRS-TH

The evaluation of the criterion- related validity was determined by comparing the MDRS-TH with the PHQ-9 using Pearson's correlation for the whole sample, and then by separately comparing the males and females. The coefficient values were found to be 0.77, 0.72, and 0.81 (p <.001), respectively.

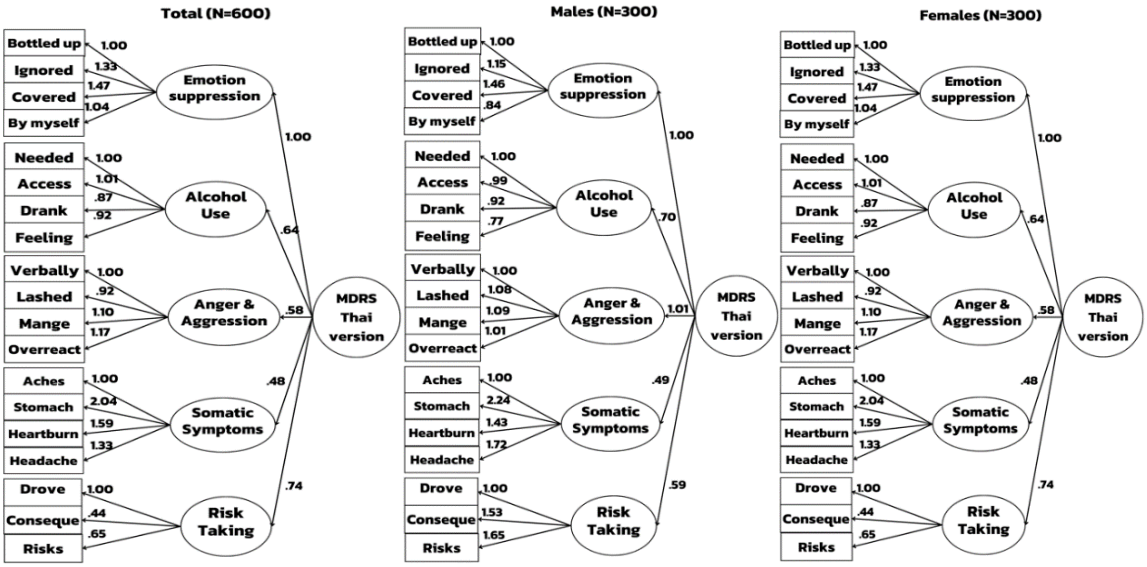

Figure 1 Standardized regression paths for the MDRS-TH (N=600), male (N=300), and female (N=300)

Table 2 Confirmatory factor analysis for fit index values

Groups	Domains	*b*	SE	t	p-value	R^2
Total (n=600)	Emotional Suppression (ES)	1				0.70
	Alcohol Use (AU)	0.60	0.05	11.97	<0.001	0.33
	Anger & Aggression (AA)	0.83	0.05	16.53	<0.001	0.79
	Somatic Symptoms (SS)	0.46	0.04	12.32	<0.001	0.68
	Risk-Taking (RT)	0.58	0.06	10.62	<0.001	0.99
$\chi2$ = 719.55, df = 147, p <0.001, CFI = 0.918, TLI = 0.905, SRMR = 0.050, RMSEA = 0.051						
Males (n=300)	Emotional Suppression (ES)	1				0.64
	Alcohol Use (AU)	0.70	0.09	7.96	<0.001	0.32
	Anger & Aggression (AA)	1.00	0.10	10.40	<0.001	0.77
	Somatic Symptoms (SS)	0.49	0.06	7.89	<0.001	0.55
	Risk-Taking (RT)	0.59	0.08	7.69	<0.001	1
$\chi2$ = 700.555, df = 147, p <0.001, CFI = 0.854, TLI = 0.831, SRMR = 0.079, RMSEA = 0.112						
Females (n=300)	Emotional Suppression (ES)	1				0.65
	Alcohol Use (AU)	0.64	0.07	8.80	<0.001	0.40
	Anger & Aggression (AA)	0.58	0.06	10.06	<0.001	0.64
	Somatic Symptoms (SS)	0.48	0.06	8.76	<0.001	0.80
	Risk-Taking (RT)	0.74	0.09	7.97	<0.001	0.53
$\chi2$ = 581.529, df = 147, p <0.001, CFI = 0.871, TLI = 0.850, SRMR = 0.074, RMSEA = 0.099						

Table 3 Internal consistency of the MDRS-TH assessment separated by sex

Subscales	Item numbers	Total (n=600)	Males (n=300)	Females (n=300)
		Cronbach's alpha coefficient	Cronbach's alpha coefficient	Cronbach's alpha coefficient
1) Emotional Suppression (ES)	1, 2, 8, 17	0.80	0.75	0.83
2) Drug Use (DU)	13, 22, 18	0.70	0.9486	0.3967
3) Alcohol Use (AU)	3, 10, 11, 15	0.92	0.93	0.91
4) Anger & Aggression (AU)	12, 19, 20, 21	0.89	0.90	0.83
5) Somatic Symptoms (SS)	5, 6, 7, 9	0.78	0.76	0.78
6) Risk-Taking (RT)	4, 14, 16	0.64	0.65	0.62
Total	1-22	0.92	0.91	0.91
McDonald's Omega		0.89	0.86	0.87

5. Discussion

5.1 Construct validity

Findings from this study showed that the Thai version of the original six factor MDRS model had been inconsistent with the empirical data in both the combined and sex-specific samples. Given that the sub-component of 'Drug Use' had been found to have a low factor loading (standardized loading=0.23), which was below the recommended criteria (DeVellis, 2016), it was consequently excluded from the model. Participants' responses to the sub-component of 'Drug Use' had yielded very low endorsement rates, which suggested that they may have been minimizing their responses to this domain. According to this study, which collected data from a sample of 600 people, it was found that only 7 respondents (1.16%) had reported using drugs and participating in substance abuse as a coping mechanism in order to deal with their stress and to manage their negative emotions. This may be explained due to Thai cultural factors. Substance misuse in the context of Thai society is illegal and socially proscribed. This can be seen from historical evidence from the reign of King Authong (the first king of Ayutthaya) in 1360, the first formal legal document on substance misuse (i.e., opium) in Thailand's history banned the trade and use of opium and instituted fines and custodial punishments for those, who broke the law (Kalayasiri et al., 2019). Moreover, people in Thailand generally have very negative attitudes towards substance use (Tanajinda, & Siriwato, 2020). Previous research indicated that government service providers and Thai citizens have expressed a high degree of stigma and discrimination toward methamphetamine users in particular (Jaisan et al., 2018). Another complicated issue is related to the composition of the sample. Many participants were employees (30.83%) and almost half (48.33%) of them had graduated with post-graduate degrees. These groups may be at a lower risk of substance misuse when stressed or distressed. In stark contrast, some of the younger participants, who were unemployed and who were from less well-educated backgrounds, had exhibited a higher risk for using drugs to manage stress and distress (Pianchob, & Kaesornsamut, 2018; Prateepteranun, 2019).

After eliminating the sub-component of 'Drug Use' from the model, a satisfactory model fit was observed for the combined sample. Accordingly, MDRS-TH consisted of 5 components: 1) Emotional Suppression, 2) Alcohol Use, 3) Anger & Aggression, 4) Somatic Symptoms, and 5) Risk-Taking. Consistent with previous studies, the highest weighted sub-component of MDRS-22 was 'Anger & Aggression' (Rice, 2012). This finding is not only noteworthy, but it is also consistent with the norms of masculinity, which place emphasis on the fact that males must be strong, invulnerable, and must avoid displays of perceived weakness (i.e., tearfulness). The need to control one's emotions (Addis, 2008; Brownhill, 2005); the presentations of irritability, anger and aggressive behaviors (Oliffe et al., 2013; Rochlen et al., 2010); and to control heavy drinking (Bryant, 2008; Brown et al., 2012; Chuick et al., 2009) are behaviors, which are considered socially acceptable for men, and which are in line with traditional masculine gender norms (Berke et al., 2020; Hunt, & Antin, 2019; Sherer, & Wong-Uparat, 2009). Societal expectations of masculinity may contribute to the high prevalence of anger and aggression among men.

Regarding the sex-specific CFA analysis, the model was found to be inconsistent with the empirical data even after omission of the 'Drug Use' sub-component. Given that the five factors model was supported for the full (N=600) sample, this finding likely suggested that the sex-specific analyses had exhibited insufficient statistical power. Hence, future sex-specific research using the MDRS-TH should seek to collect samples of males (>400 cases) to further explore the psychometrics of the scale. In a previous study, Herreen et al (2022) examined the construct validity of the MDRS-22 assessment among 950 Australian males, while a study conducted by Walther et al (2021) examined the construct validity of the German version of the MDRS-22 among a sample of 1,605 people (671 males and 934 females). These large numbers of samples would allow for a more robust analysis and would increase the likelihood of detecting any sex-specific differences in the factor structure. Additionally, increasing the sample size would also provide a more representative and generalizable understanding of the psychometrics of the MDRS-TH for males.

The results from both studies had validated the six factors model, which suggested that cultural differences between Thai and Western cultures may have also exerted an effect on the participants' responses. Nonetheless, as internal consistency values for the sub-components in the present study were high, such cultural differences may be

relatively minor. However, for future research, conducting cross-cultural comparisons is essential to analyze data across diverse cultural groups, with the aim of identifying both similarities and differences. This approach can offer a more nuanced understanding of how cultural factors may impact responses to depression among men in varying cultural contexts.

5.2 The Internal consistency reliability

The internal consistency reliability using Cronbach's alpha coefficient for each sub-component ranged 0.64-0.92, with an overall coefficient of 0.92. For the sex-specific analyses, the male and female coefficients were 0.91 and 0.91, respectively. This was consistent with the original MDRS assessment questionnaire that was employed with 454 Australian men, from which it was found that the Cronbach's alpha coefficient of each sub-component was between 0.72-0.91 and the overall had been 0.9226. Our findings were also consistent with the adaptation of the German version of the MDRS, which had ranged from 0.62-0.91 (Walther et al., 2021). This was consistent with the results from studies examining the concepts of masculinity in Western and Eastern cultures, which revealed consistent psychological characteristics. In particular, the emphasis was on demonstrating emotional stability, avoiding expressions of weakness, and adhering to characteristics, such as empowerment, leadership independence, and self-reliance (Kaewjanta, & Sangchart, 2018). Thus, when men experience depression in both cultural contexts, they may show similar symptoms, such as emotional suppression, drinking alcohol, irritable behaviors, and aggression. Importantly, those MDRS assessments, which was used with a culturally diverse group of men, had shown high levels of internal consistency.

5.3 The Criterion-related validity

The MDRS-TH had an acceptable relationship (r=0.77) with the PHQ-9 for the full sample, and also for the male and female sub-samples (r=0.72 and r=0.81). In the present sample, the MDRS-TH had been strongly associated with the clinical symptoms of major depression among Thais. This finding was determined to be consistent with previous research studies that had investigated the psychological properties of the MDRS in German men, in which the Spearman correlation coefficient between the MDRS-22 and PHQ-9 had indicated a positive association (r=0.73) (Walther et al., 2021).

5.4 Strengths, Limitations and Future study

Strengths:

1) The study fills a critical gap in the literature by introducing and validating the Male Depression Risk Scale (MDRS) to identify men who are vulnerable to depression and suicide. The study addresses an urgent need for a screening instrument tailored to the specific symptoms of depression in men.

2) By using a cross-sectional design with a sizable sample size (N=600), the study underpins the statistical robustness and applicability of its findings. Furthermore, the use of confirmatory factor analysis and the assessment of internal consistency (Cronbach's alpha) reflects a careful approach to the development and validation of the scale.

3) The validation results emphasize the strong psychometric properties of the MDRS-TH, as evidenced by satisfactory fit indices in the confirmatory factor analysis, high internal consistency (Cronbach's alpha = 0.89), and robust criterion-related validity as evidenced by the correlation with the PHQ-9 (r=0.77).

Limitations:

1) Sampling bias: recruiting participants via social media may lead to selection bias as it predominantly targets individuals who are active on these platforms. Consequently, the sample may not adequately represent the broader male population, which could lead to sample bias and limit the generalizability of the findings.

2) Cross-cultural validity: although the study validates the MDRS-TH, its cross-cultural validity across different cultural groups in Thailand is not assessed. This limitation restricts the scale's applicability beyond the Thai context and raises concerns about its effectiveness in different cultural settings.

3) Longitudinal assessment: the cross-sectional design limits the ability to draw conclusions about the temporal stability and predictive validity of the MDRS-TH. A longitudinal study with follow-up would provide insights into the course of depressive symptoms and the utility of the MDRS-TH in identifying at-risk individuals over time.

6. Conclusion

The results suggest that the MDRS-TH has robust psychometric properties, confirming its effectiveness as a reliable psychological assessment tool. The development of a male-specific screening tool for depression holds promise for efficiently detecting depression in this population. Consequently, early detection of depressive symptoms in men may reduce or prevent the risk of major depressive disorder and suicide in men.

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